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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/781,099

02/17/2004

Robert Floyd Payne

TI-37351

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06/11/2007

TEXAS INSTRUMENTS INCORPORATED

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EXAMINER

DEPPE, BETSY LEE

ART UNIT

PAPER NUMBER

2611

NOTIFICATION DATE

DELIVERY MODE

06/11/2007

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/781,099

Applicant(s)

PAYNE ET AL.

Examiner

Betsy L. Deppe

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 35 and 36 is/are allowed.
- 6) ☒ Claim(s) 1-34 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 February 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>2/17/04</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the anti-glitch circuit receiving the interpolator control signals (see claims 11 and 24) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

2. The claims are objected to because of the following informalities:
- a. in claim 1, line 7 and claim 24, line 4, "finite" should be inserted before "state";
 - b. in claim 1, line 11 and claim 25, line 2, "clock" should be inserted before "phases";
 - c. in claim 1, line 12, "interpolator" should be inserted before "control"; and
 - d. in claim 27, line 14, "two indicated clock phases" should be "two determined clock phases" (see lines 11-12).

Appropriate correction is required.

3. Claims 4 and 7 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

4. With regard to claim 4, claim 2 recites the clock recovery device as "further comprising a rate/mode control circuit" thereby implying that this circuit is separate or independent from the other limitations recited in claim 1. Therefore, claim 4 does not further limit the subject matter of claim 2.

5. With regard to claim 7, claim 5 recites the clock recovery device as "further comprising a frequency detection control circuit" thereby implying that this circuit is

separate or independent from the other limitations recited in claim 1. Therefore, claim 7 does not further limit the subject matter of claim 5.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 3, 6, and 12 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

9. With regard to claim 3, the specification does not describe a clock recovery circuit comprising the rate/mode control circuit (see claim 2) wherein the functions are integrated within the finite state machine and the programmable divider (see claim 3). Figure 6B shows the rate/mode control circuit of claim 2 but the specification does not describe integrating these functions into other components, as recited in claim 3. The function of the rate/mode control circuit 665 is unknown/unclear if the described functions are integrated into other components. Therefore, one skilled in the art is not enabled to make and/or use the claimed invention.

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10. Similarly, with regard to claim 6, the specification does not describe a clock recovery circuit comprising the frequency detection control circuit (see claim 5) wherein the functions are integrated within the finite state machine and the programmable divider (see claim 6). Figure 7 shows a frequency detection control circuit of claim 5 but the specification does not describe integrating these functions into other components, as recited in claim 6. The function of the frequency detection control circuit 725 is unknown/unclear if the described functions are integrated into other components. Therefore, one skilled in the art is not enabled to make and/or use the invention.

11. Similarly, with regard to claim 12, the specification does not describe a separate anti-glitch circuit (see claim 11) wherein the functions of the anti-glitch circuit are integrated within the finite state machine.

12. Claims 1-34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

13. In claim 1, "based on the control signals" renders the claim vague and indefinite since it is unclear what is "based on the control signals." For example, is the "select[ing] a clock phase output" on line 10 or "generat[ing] from the two selected phases" based on the control signals?

14. With regard to claim 3, it is unclear which elements perform the rate/mode control function, i.e. the rate/mode control circuit (see claim 2) or the finite state machine and programmable divider (see claim 3).

15. With regard to claim 6, it is unclear which elements perform the frequency detection control functions, i.e. circuit of claim 5 or the finite state machine and programmable divider of claim 6.

16. Claim 8 recites the limitation "the recovered clock or data" in line 2. There is insufficient antecedent basis for this limitation in the claim.

17. Claim 9 recites the limitation "the clock recovery loop" and "the updates" in lines 1 and 3, respectively. There is insufficient antecedent basis for the limitations in the claim.

18. With regard to claim 12, it is unclear which elements perform the anti-glitch functions, i.e. circuit of claim 11 or the finite state machine of claim 12.

19. Claim 24 recites the limitation "the delay elements" and "the required steps" in lines 7 and 8, respectively. There is insufficient antecedent basis for these limitations in the claim.

20. Claim 24 recites the limitation "the interpolator control signals" in line 9. There is insufficient antecedent basis for this limitation in the claim.

21. With regard to claim 25, it is unclear what is meant by "received from a clock input based on the early or late indication relative to the previously selected clock phase" on lines 3-4.

22. Claim 25 recites the limitation "the previously selected clock phase" in line 4. There is insufficient antecedent basis for this limitation in the claim.

23. Claim 26 recites the limitation "the phase interpolator" in lines 2-3. There is insufficient antecedent basis for this limitation in the claim.

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24. With regard to claim 27, the following limitations lack antecedent basis: "the relative time difference" (see lines 14-15); "the prior or current phase transition indication" (see line 15); and "the clock phase error" (see line 16).

25. With regard to claims 31 and 32, the "obtaining" steps in the respective claims lack antecedent basis. "Wherein" suggests that the step has been introduced but claim 27 does not recite either of the obtaining steps.

26. The dependent claims are rejected under the same grounds as the claim(s) from they depend.

Allowable Subject Matter

27. Claims 1-34 may be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

28. Claims 35 and 36 are allowed.

29. The following is a statement of reasons for the indication of allowable subject matter: prior art of record does not teach or suggests in combination a method of preventing interpolator update glitching that includes receiving a data rate input and voting operation indication; selecting a plurality of partial phase corrections based on the data rate and enabling corresponding delay elements; and generating a plurality of successive partial phase corrections, as recited in claim 35.

Conclusion

30. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Mar (US Patent No. 6,114,914), Gu (US Patent No. 6,901,126 B1), and Chen et al. (US Patent No. 7,162,002 B2) disclose recovery circuits that include a phase interpolator, a state machine, and/or a programmable divider.

Bailey (US Patent No. 7,079,615 B2) discloses a delay locked loop that enables delay elements based on a thermometer coding scheme.

31. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Betsy L. Deppe whose telephone number is (571) 272-3054. The examiner can normally be reached on Monday, Tuesday and Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on (571) 272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

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USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A handwritten signature in black ink, appearing to read 'B. Deppe', with a stylized flourish at the end.

Betsy L. Deppe
Primary Examiner
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